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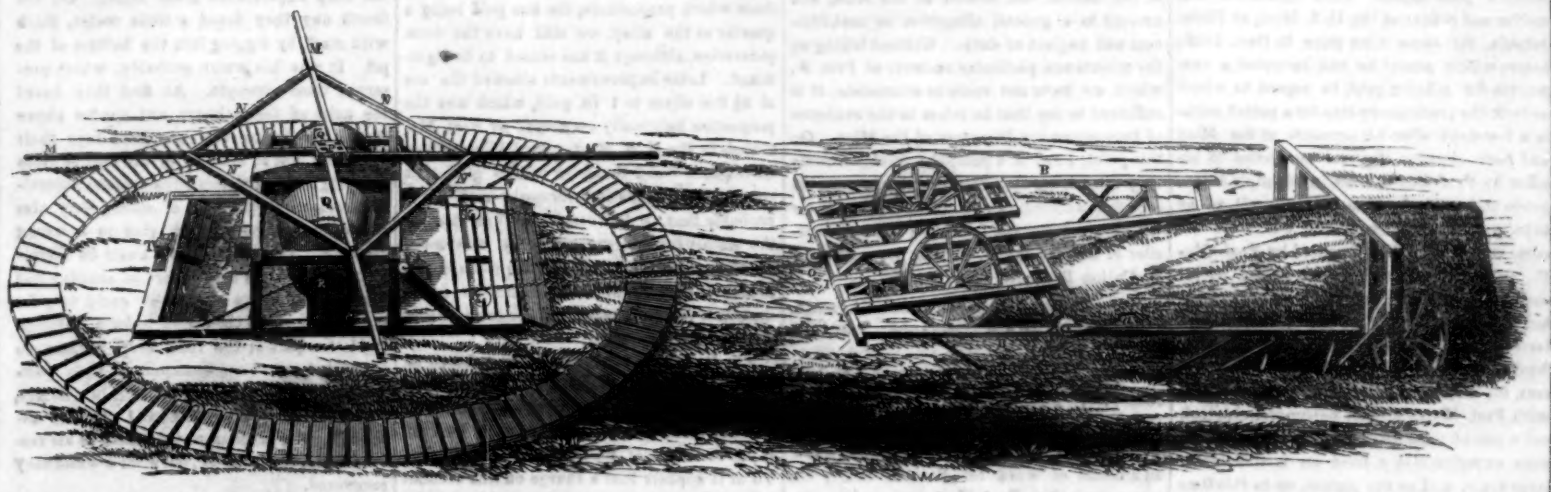
GAVETT'S DITCHING AND FENCING PLOW.

The annexed engravings are views of a plow for ditching and fencing invented by H. L.F.Gavett of Jackson, Mich., patented in Sept. 1851, but now improved as represented. The nature of this invention consists in so arranging a series of cutters, mould boards, and guides, as that two wedge-shaped slices of sod shall be cut and gradually turned upon the broad edges, with their bottoms together, and set in an upright position upon the highest or middle part of the bottom of the ditch from which they were cut, thus making at one operation, two ditches, and a complete sod fence between them, said ditches having slanting bottoms, and the fence sodded entire from top to bottom.

Figure 1 is a perspective view of the plow, artificial roadway for wet land, and the windlass to work the plow by oxen or horses; figure 2 is a perspective view of the plow on its carriage; figure 3 is a perspective view of the plow at work, and figure 4 is a perspective view of the windlass. The same letters refer to like parts.

The bottom of the plow, A, is made of two pieces of plank cut slanting at one end, and secured together at their longer edges, and so inclined from their outer or shorter edges, as to cut deeper at said edges than at the centre. Upon the forward or slanting ends of these two planks are secured the bottom knives like two common plow shares for cutting the slice of sod loose at the bottom, and thus

Figure 1.



forming the angular bottom of the ditches.—At the centre of the forepart of the plow projecting upward from the angle made with the bottom knives is a middle cutting and drawing knife shaped like a slanting ridge. This divides the slice of sod at its centre and thinnest part so as to cut the sod in two parts, to make them draw and fold together as the rear end of the plow passes through, so as to form a conical ridge or turf wall in the centre, and a slanting ditch on each side. In figures 1 and 3, the plow is buried underneath the sod, and the ditch is shown made at the end on one side, with the turf wall raised in the centre. A' A', are side knives flaring upwards, and are united like a continuous plate with the cutting and centre ridge knife, so that the main plow is like two plows with mould boards united together with one high centre ridge and flaring wings at each side, the front parts of all being slanting cutters for the purpose of cutting easily. The rear end of the mould board is like a last for the crimping of boot uppers. There are guide rods inside of the side shears and wings which let into the two slices of sod as they are cut and pass under them, thus guiding and holding them upon the mould board while they are being drawn in by the plow and set in their upright position. These guide rods twist like the side knife flanges to the end of the plow, and act to gather and press up the cut sods to the centre with a screw like action, the sods, however, by the form of the plow fall naturally into their central position. *d d d* are coulters secured in beams in front of the shears or knives of the plow. The plow is supported in a suitable frame or carriage, and is thereby capable of being drawn on the wheels, the plow elevated, and vice versa. Figure 2 shows the plow as being drawn on its wheels; D are the hind wheels; they are secured with their axles in crank arms, E, and are connected to pulleys, F, which have their axes in the upright beams, and have chains in their peripheries passing up and over a roller on the axle of the crank handle, C. By turning said handle, the wheels are therefore elevated or lowered in the frame at pleasure, to allow the plow to enter the soil, or to have it elevated above it.

The front wheels, *G G*, are operated on the same principle as shown in figure 3. Their axles are in suspended boxes capable of being raised or lowered by the lever, *a*, working by ratchet wheel and pallet, the roller shaft with the barrels, *c c*, on it, over which pass two ropes, *b b*, connected to the frames, K K, which swing on straps at I I, and are drawn backwards and laid horizontally as shown in figure 1, and in the act of being raised in figure 3. The wheels are hung on straps, L L, at J J, which are also swung up as shown in figure 1. The shaft of the barrels is extended

Figure 2.

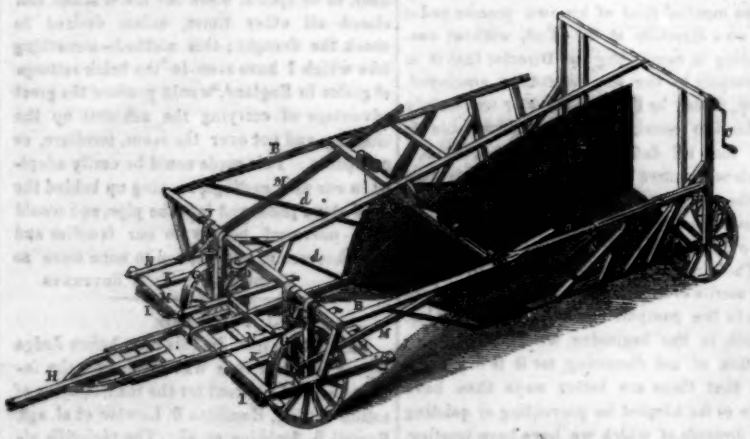
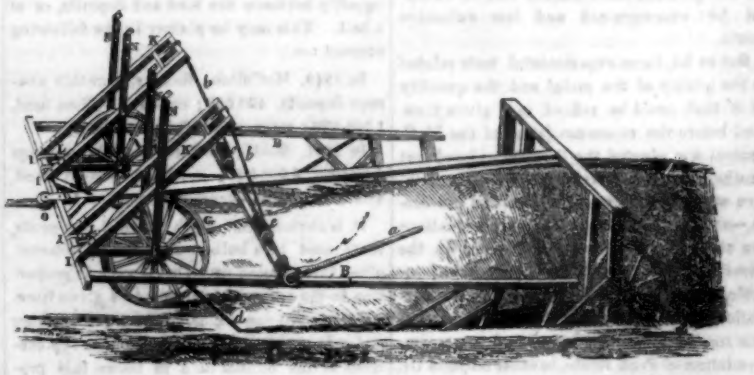


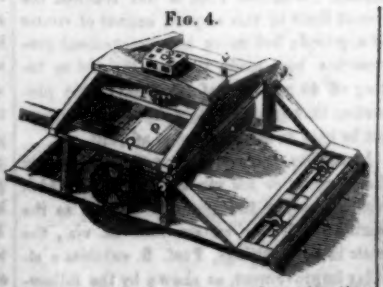
Figure 3.



across on the beams, B B. The guide braces N N, are shown with their pins out, and in the act of being raised. M M are the front and back beams of the front carriage; H is the pole of the carriage.

O is the pulley by which the plow is drawn by the chain, Y Y, passing over the drum of the windlass, figure 1; X X are two guide pulleys on the windlass frame; M M are the levers of the windlass, to which the horses are secured, and N N are cross braces; P is a centre head with a vertical short spindle on which is a bevel pinion, P', gearing into a bevel wheel, which drives the two drums, figure, 4, of the windlass. These drums can be let down on the ground by the same arrangement as that described for letting down and elevating the back wheels, D D, of the plow; W W are chains which secure the windlass frame to the roadway, V, figure 1. The frame is also held in the ground by hooks on the lower side of the front and back platforms. It will be observed that the plow is guided to move in a straight line by the manner in which the chains are directed.

FIG. 4.



This plow is designed for meadows and prairies, both for the purpose of constructing turf fences and making ditches. It is especially adapted for plowing meadows that are marshy, during a period when they are rather dry and a good sod formed on the surface. The plow effects two objects, one the making of the turf wall, and the other draining the land by forming a ditch on both sides of the wall.—By this machine many marshes now useless might be drained and walled at no great expense. The turf walls being conical, shed off the water of rains, so that an objection against their stability is removed by their form. We commend this plow to the attention of all ag-

riculturists who are interested in ditching, and have large wet meadows or prairie lands which require ditching and cheap fencing.

More information may be obtained by letter addressed to the patentee, at Jackson, Mich.

MISCELLANEOUS.

The Philadelphia Mint—Refining Gold—Its Troubles and Trials.

On page 29, this Vol. "Scientific American," we briefly reviewed a pamphlet by R. S. Culloh, late Metal Refiner at the Mint at Philadelphia, now of Princeton, N. J. An answer to that pamphlet has been published and is now before us, by the present Melter and Refiner, James C. Booth. The pamphlet is a letter to our now ex-President Fillmore, and we have been requested to peruse, and notice it, and in courtesy we will do so. The letter of Prof. Booth, is remarkably temperate in language and we like the spirit which pervades it.

The historical origin of the transaction in question may be thus briefly stated from Prof. Booth's publication. Prof. McCulloh was melter and refiner at the U. S. Mint, at Philadelphia, for some time prior to Dec., 1849; before which period he had invented a new process for refining gold, in regard to which he took the preliminary step for a patent within a few days after his accounts at the Mint had been closed. He was succeeded in his office by Prof. Booth, who, in attempts to improve the methods actually in use, fell, as he says, upon one which turned out to be the same with that earlier invented by Prof. McC., and which, though characterized by remarkable facility in the earlier stages, presented extreme difficulty in the lamination, afterwards, of the gold refined by it. Prof. Booth was thus induced to devise another process, for which, in August, he, in conjunction with Prof. Morfit, now of Baltimore, also took out a patent. As neither of the processes had been experimentally tried on a sufficiently large scale, and as the parties, up to this time at least, appear to have had mutual confidence in one another's learning, skill, and fairness, they concluded to join their interests in the two patents, and subsequently procured an appropriation from Congress of $25000 for the purchase of that one which, upon fair trial at the Mint in Philadelphia, should prove to be the better. The experiments for determining this question were made in the last part of 1850 and first month of 1851, under the instructions of the then Director of the mint (Dr. R. M. Patterson) and by Prof. Booth, who, having succeeded in overcoming the brittleness of the metal that had before resulted under the McCulloh process, recommended that process for adoption at the Philadelphia Mint, where the establishment was ample and regular, and the other—the Booth and Morfit process—for adoption in California as being the cheapest and most flexible and best adapted for extemporized and less extensive mints.

But so far, these experimental tests related to the quality of the metal and the quantity of it that could be refined in a given time. And before the recommendation of the McC. process was adopted, the Director ordered that another very important particular—the relative waste of gold, under the several processes,—should be observed. These observations are stated to have been in fact made by the Director himself and to have proved unfavorable, by showing a greater waste in the McCulloh than in the old or Mint process, with this result before him, in spite of the recommendation of Prof. Booth, in other respects Dr. Patterson disapproved the introduction of the McC. process into the Mint.

Prof. McC. was naturally dissatisfied with this issue, proposed and with the consent of Prof. B. procured a dissolution of the partnership which had existed in the two patents; and founded upon the circumstances attending the events which we have thus briefly sketched, grave complaints and charges against Prof. B. in particular. These charges were formally laid in the Treasury Department, from which they were duly referred, in the latter part of 1851, to the then Director of the Mint—Dr. Eckert, successor to Dr. Patterson—for investigation. The Director reported them back as unsustained. Subsequently, the Treasury Department authorized Prof. McC. to apply his process himself within the walls of the Mint at Philadelphia, as he did, on April 1, 1852, upon about a quarter million of gold, but in result showing more waste than the ordinary Mint process, the Director disapproved the introduction of the new method. To this disapproval, Prof. McC. takes exception; and in a printed letter to Mr. Corwin, in August, 1852, states his exceptions and renews the charges against Prof. B. We understand the pamphlet of Prof. B. is a reply to the original and to the renewed charges.

The charges thus replied to may be assembled in three groups; according to their purely personal, their official and their mixed character.

To the first of these belongs the allegation of disingenuousness at the time of the formation of the partnership. Prof. B. declares that he assented to the partnership originally at Prof. Culloh's suggestion and acquiesced in its dissolution at Prof. McC.'s request.

The second group of charges are those which affect the official relation and standing of the Melter and Refiner at the Mint, and amount to a general allegation of unskilfulness and neglect of duty. Without taking up the minute and particular answers of Prof. B, which we have not room to enumerate, it is sufficient to say that he refers to the evidence of two successive Directors of the Mint. On this point, Prof. B.'s pamphlet furnishes some very interesting statistics, which of course we accept as authentic and reliable. From these we have reduced the following table of deposites of Gold at the U. S. Mint per month.

McCulloh Refiner—

	Least amount.	Greatest.	Average.
1849 . . .	30,000	793,000	404,200
Booth Refiner—			
1849 . . .	747,000	1,669,000	1,208,000
1850 . .	1,005,000	4,579,000	2,660,750
1851 . .	2,818,000	5,577,000	3,977,333

With these results before us, which show an amount of work for Prof. B. nearly ten times as great as Prof. McC. was used to—indeed an amount that we believe one is quite correct in saying to be unprecedented in the annals of minting.

It is true that the existence of a large bullion fund might be significantly connected with this silence of depositors, who being paid out of such a fund. directly, the *value* of their deposits is ascertained by assay and weighing, have no reason for concern with the subsequent management of what they have deposited and sold. But according to Prof. B.'s statistics, the bullion fund of 1849, in Prof. McCulloh's time, was $1,000,000, when the average monthly deposit was $404,200 and the ratio, therefore, of the amount kept on hand to meet payments to the amount required to be paid, was very nearly 2½ to 1. The same fund now is $4,000,000, and the average monthly deposits as much, showing a ratio of equality between the fund and deposits, or of 1 to 1. This may be plainer in the following account:—

In 1849, McCulloh, Refiner, monthly average deposits, 400,000; constant bullion fund, 1,000,000; ratio—deposits 1, bullion 2½.

In 1851, Booth, Refiner, monthly average deposits, 4,000,000; constant bullion fund, 4,000,000; ratio—deposits 1, bullion 1.

It is obvious that, with prompt payments, there must be a bullion fund whose amount, other things being equal, must vary in proportion to the amount of deposits in a given time. All that skill can do, is, in the rapid melting and refining of these deposits and the replacement of the bullion fund to lessen this proportion. Whether Prof. B. has reached the utmost limit in this respect, cannot of course be apprised; but under his management progress has been made towards it; and in taking off 60 per cent. of the unfavorable proportion that existed before he certainly cannot be held to manifest want of skill.

In another important particular relating to the economy of his management, and which is of interest to the government, just as the diminution of the bullion fund is, viz., the *waste* in the meltings, Prof. B. exhibits a similar improvement, as shown by the following table:—

	Oz. melted.	Oz. wasted.	Loss.
McCulloh, Refiner—			
1849 . . .	673,000	239	·00035+
Booth, Refiner—			
1850 . .	3,000,000	689	·00022+
1851 . .	2,555,000	635	·00025—
1852 . .	5,074,000	1,247	·00025—

The weights have been given here only to the nearest thousand ounces; in the pamphlet they are set down to the nearest ounce. The quantities in the last column result from the exact numbers; the sign + showing that the quotient is too small, and the sign — that it too high. They show a diminution of waste effected by Prof. Booth of 1-10000th, and a saving of that extent over the results of his predecessor. Had the waste admitted by Prof. McC., during the latter part of his management, been allowed to continue by Prof. B., the dead loss would have been, up to Aug. 1852, more than 1000 ounces, or upwards of 18000 dollars, for the saving of which Prof. B. may undoubtedly claim credit.

Again, in the earliest practice of refining gold by the nitric acid process, 3 lbs. of silver were alloyed with 1 lb. of gold, in order to effect the subsequent *parting* of the latter; from which proportions, the fine gold being a quarter of the alloy, we still have the term *quartation*, although it has ceased to be significant. Later improvements allowed the use of 2½ lbs. silver to 1 lb. gold, which was the proportion habitually employed by Prof. McCulloh in the U. S. Mint Prof. B. avers that he requires but 2 lb. silver to 1 lb. gold, thus sparing 1-5 of the silver formerly used. It is probable that, in this respect he has reached the utmost limit of economy; but whether or no he has certainly lessened the room for reproach in thus economizing upon the costly materials required even by his immediate predecessor.

The last group of charges to be referred to, affect at once the official and individual character of the party, and include allegation of fraud or clumsiness in the trials made by Prof. B., at the Mint, of Prof. McC.'s new process. To us it appears that a charge on this account is not happily nor reasonably made by the latter; for the issue of those trials was a direct and positive recommendation of the said process for exclusive employment at the Mint in Philadelphia. Whether the trials, then, were fairly and skillfully or dishonestly and awkwardly made, Prof. McCulloh, inasmuch as he obtained a favorable verdict, is hardly the person to be heard in complaint. Other persons, we ourselves for instance, might express our surprise that so emphatic a recommendation should have been given before one of the most important considerations—the waste—had been weighed; but not the party whose interest was in the way of being subserved by the premature recommendation. But however this may be, it appears that Prof. McC. had and used the opportunity of nearly three months' trial of his own process under his own direction at the Mint, without succeeding in convincing the Director that it is preferable to the one habitually employed. Now, it may be that the Director was unduly difficult to convince, but it is reasonable to say that all defects whatever in Prof. B.'s trials were cured by the actual intervention of the party devising, and therefore most interested and best knowing how to carry out his own process.

The cause of our remarks has led us now to the merits of the processes which have given rise to the pamphlet in question; a subject which, in the beginning, we hinted our intention of not discussing, for it is our opinion that there are better ways than have been so far adopted for preventing or quieting the discords of which we have been treating, and which neither helps science herself nor her votaries. That it may not be supposed we were using random phrases or dealing in unreflected generalities, we conclude this notice with what seems to us a practical suggestion:—Let a commission of three (or any multiple of three) persons sufficiently distinguished by their knowledge of the subjects, be constituted under the authority of the Treasury Department, whose functions shall be to superintend at some fitting time, and upon a suitable scale at the Philadelphia Mint, full and fair trials, of the proposed new processes, so as to set at rest, once and for all the questions that have been raised; in whose discussion the public can hardly be expected to take interest further than as they affect the vindication and, if requisite, the amelioration of the Mint establishment, whose integrity and judicious administration ought to be, for the credit of the government of our country, above suspicion.

Buried Alive.

Galignani gives a thrilling account of two men and a boy being buried six days and six nights, in a marl pit at Ecrettville, in the department of the Seine Inferieure, who were finally rescued alive. During the whole of that time they were without food, without light, and almost without clothes; and they were in such a confined place, that with the exception of the boy, they could not stand upright. Boitard, the eldest man, declares that during the whole time he did not sleep more than two hours; but his companions, and especially the youngest one, more. They slept back to back. They felt no hunger and Boitard says that even if they had provisions, they would not have touched them; but they experienced great thirst. On the fourth day they found a little water, thick with marl, by digging into the bottom of the pit. It was this water, probably, which preserved their strength. At first they heard the noise of the pickaxes and spades above them; but during the last three days their breathing was so loud as to prevent it from reaching them, and this circumstance naturally increased their agony of mind; they also feared the miners were digging in a wrong direction. One of them had about 50 chemical matches and a small piece of candle; but though they often tried, they could not, for want of air, cause the candle to burn. During the latter part of the time they became so exhausted as to be unconscious of their position; but the boy once cried as if in a dream, "There is the rope, Boitard! Let us ascend!" One moment and a breath of air rescued them, they fainted, but after a while they recovered.

(For the Scientific American.)

Dust from Stoves.

As a subject for improvement in stoves—parlor, cooking, or any other description, let me suggest to our inventors and patentees, the remedy of one serious detriment which has invariably been overlooked up to the present hour—that is, a mode, plan, or adaptation of carrying off the dust when it is raked so that it shall not spread over the room, covering every thing with ashes—that is, dust; to me, and I should suppose to every one, it is a matter of serious inconvenience.

The remedy I propose is to have an aperture under the grating leading to a pipe-way communicating with the usual pipe attached to all stoves, this aperture to have a sliding door, to be opened when the fire is raked, and closed all other times, unless desired to check the draught; this method—something like which I have seen in the brick settings of grates in England, would produce the great advantage of carrying the ash-dust up the chimney and not over the room, furniture, or occupants. This mode could be easily adopted in our new castings, running up behind the back stove plate, and into the pipe, and would be a universal benefit to our families and housekeepers in general, and to none more so than to Yours, &c., A Sufferer.

Patent Case.

On the 12th inst., in this city, before Judge Nelson, a patent case was decided for the infringement of a patent for the manfacturing of cotton batting, Hamilton B. Lawton et al. agt. Russell B. Stebbins et al. The plaintiffs alleged that defendants infringed their patent for a machine for manufacturing batting, they having manufactured and sold 1,000,000 lbs. of batting, made on their plan. The amount of damages claimed was $10,000. A verdict was granted for $1,235.

The Floating Battery.

Preparations for constructing the proposed floating battery for the United States Government, designated for harbor defence, are actively going forward at Hoboken, by Robert L. Stevens, the contractor.

Mother of Pearl.

Mother-of-pearl is the hard, silvery, internal layer of several kinds of shells, especially oysters, the large varieties of which in the Indian Seas secrete this coat of sufficient thickness to render the shell an object of manufacture. The genus of shell-fish, *Pentadina*, furnishes the finest pearls as well as mother-of-pearl: it is found round the coasts of Ceylon, near Ormus, in the Persian Gulf, at Cape Comorin, and in some of the Australian seas. The dealers in pearl-shells consider the Chinese from Manilla to be the best; they are fine, large, and very brilliant, with yellow edges. Fine large shells of a dead white are supplied by Singapore. Common varieties come from Bombay and Valparaiso, from the latter place with jet black edges.—South Sea pearl-shells are common, with white edges. The beautiful dark green pearl-shells called ear-shells or sea-ears, are more concave than the others, and have small holes round the margin; they are the coverings of the Haliotis, which occurs in the Californian, South African, and East Indian Seas.

In the Indian collection of the Great Exhibition, specimens of the finest pearl shells were shown, such as the Meleagrina margaritifera, Haliotis gigas, Haliotis iris, and a large species of Turbo, which shells are known in commerce as flat-shells, green snail-shells, buffalo-shells, Bombay shells. Messrs. Fauntleroy and Mr. Banks had also some fine collections. The latter gentleman states that the shore of the Sooloo Islands affords the finest shells.

The beautiful tints of the mother-of-pearl depend upon its structure; the surface being covered with a multitude of minute grooves, which decompose the reflected light. Sir David Brewster, who was the first to explain these chromatic effects, discovered, on examining the surface of mother-of-pearl with a microscope, "a groved structure, like the delicate texture of the skin at the top of an infant's finger, or like the section of the annual growths of wood as seen upon a dressed plank of fir. These may sometimes be seen by the naked eye; but they are often so minute that 3,000 of them are contained in an inch." It is remarkable that these iridescent hues can be communicated to other surfaces as a seal imparts its impress to wax. The colors may be best seen by taking an impression of the mother-of-pearl in black wax; but "a solution of gum arabic or isinglass, when allowed to indurate upon a surface of mother-of-pearl, takes a most perfect impression from it, and exhibits all the communicable colors in the finest manner, when seen either by reflection or transmission. By placing the isinglass between two finely-polished surfaces of mother-of-pearl, we obtain a film of artificial mother-of-pearl, which, when seen by single lights, such as that of a candle, or by an aperture in the window, will shine with the brightest hues."

It is in consequence of this lamellar structure that pearl shells admit of being split into laminæ for the handles of knives, for counters, and for inlaying. Splitting, however, is liable to spoil the shell, and is therefore avoided as much as possible. The different parts of the shell are selected as nearly as possible to suit the required purposes, and the excess of thickness is got rid of at the grindstone. In preparing the rough pearl-shell, the square and angular pieces are cut out with the ordinary brass-back saw, and the circular pieces, such as those for buttons, with the annular or crown-saw, fixed upon a lathe-mandrel. The pieces are next ground flat upon a wet grindstone, the edge of which is turned with a number of grooves, the ridges of which are less liable to be clogged than the entire surface, and hence grind more quickly. If the stone be wetted with soap and water it is less liable to be clogged. The pieces are finished on the flat side of the stone, and are then ready for inlaying, engraving, polishing, &c. Cylindrical pieces are cut out of the thick part of the shell, near the hinge, and are rounded on the grindstone preparatory to being turned in the lathe. The finishing and polishing are described in the third volume of Mr. Holtzapffel's excellent work on "Mechanical Manipulation." Counters, silk-winders, &c., are smoothed with Trent sand or pumice-stone and water on a buff-wheel or hand-polisher, and are finished with rotten-stone moistened with sulphuric acid, which developes finely the striated structure of the shell. For inlaid works the surface is made flat by filing and scraping; then pumice stone is used, and after this putty-powder, both on buff-sticks with water; and the final polish is given with rotten stone and sulphuric acid, unless tortoise-shell or some other substance liable to be injuriously affected by the acid be present in the inlay. In turned works fine emery paper, rotten stone and acid or oil are used. The pearl handles for razors are slightly riveted together in pairs, then scraped, sand-buffed on the wheel with Trent sand and water; thirdly, gloss-buffed on the wheel with rotten stone and oil, or sometimes with dry chalk rubbed on the same wheel; and fourthly, they are handed up, or polished with dry rotten stone.

Chemistry of Life and Alcohol.

Not long since Prof. Youmans, author of the "Chart of Chemistry," delivered a lecture in Brooklyn, on the subject set forth by the caption of this article. We intended to present a clear and brief abstract of it before this to our readers, but have not been able till now. It is a subject of great interest to every person, but strange to tell, although every person knows what alcohol is, and the various objects for which it is used, very few have a sound knowledge of its nature. The following remarks of Prof. Y. no doubt present much that is new to many persons:—

"The accomplishment of great objects by the simplest means is the standing marvel of the universe. The chief mass of all the living beings upon the globe, vegetable and animal, is made up of but four kinds of matter—four elementary substances—Carbon, Oxygen, Hydrogen, and Nitrogen. All the phenomena of life upon our planet and the appearance and disappearance of the living race—and all the changes to which they are liable depend mainly upon the properties of these four simple bodies.

These combine, taking the three forms of carbonic acid, water and ammonia, and in this state enter the plant, and are converted by it into living matter. The great office of vegetation is to convert mineral into organized substances—to impart to dead elements the property of life or vitality. It is the builder, the architect of all organization, and the great characteristic vegetable changes go forward in the leaf. The forces which produce these wonderful transmutations are solar radiations, agents which flow in all directions from the central star of our planetary system, striking upon half the globe at once, which turns incessantly to expose all parts to their action. These take effect upon the vegetable leaf. The sun has a relationship of control not only over orbs, but over atoms. Its beams possess a three-fold power—an illuminating, a heating, and a chemical power. These forces rule the ultimate atoms, decomposing carbonic acid, water, and ammonia in the leaf and regrouping their atoms into living or organized compounds. The sun is thus the perpetual creator of life upon this planet. It is the great foundation and source of those constructive powers of which the terrestrial vegetable kingdom is the theatre and effect. It affords the motive power of plants.

But other things take place upon this globe beside the building up of organization. There is also decay and dissolution. The sunbeam has its antagonist, and that antagonist is the oxygen of the air. This decomposes and destroys all organized substances, by active combustion or by slow decay. It is the great destructive agent—the enemy of all organization and life. It is continually rending organic compounds asunder, and carrying back the elements from the living to the dead world.

Now, as force was required to place these atoms in the organized condition, this force is given out again when the atoms return to the mineral state. Organized compounds are seats of force, by virtue of the arrangements of their atoms—they yield up the force when the atoms pass to the inorganic condition.—Thus, in burning wood under a steam boiler, its atoms relapse into the condition of carbonic acid and water, giving out, in the shape of heat, the power which was lodged in the organized wood, and which the machine makes mechanically available. All organized substances—all matter that has been put together in the plant, is capable of returning again to the mineral state, by combustion with the production of force.

All parts of animal bodies are organized but animals possess no power of forming their own organized compounds. The animal cannot consume the dead mineral earth, water and air, and convert them into nerve, muscle, and tissue. The materials for nerve, muscle, and tissue, originate in plants. They are formed alone in vegetable structures. Now, of the innumerable organized products of vegetable growth, foods are those few substances, which are so prepared by the hand of Nature, that they may be taken into the animal system, become a part of it, and then gradually return to the mineral state, and thus give forth their force in the form of animal power. They must be capable of becoming part of the animal organization, and then of gradually perishing out of it in that regulated, measured, normal way, which we understand by the term "health." The agent which effects these animal decompositions and destructions, is oxygen gas of the respired air. It destroys food in the body for the production of mechanical force; or a metal in a galvanic battery for the production of electrical or magnetic force. The composition of foods, therefore, and their attraction for oxygen, must be exactly adapted to the normal condition, powers, and purposes of the animal being.

But the same agent, atmospheric oxygen, through the process of slow decay, is continually carrying back all kinds of organized matter to the mineral world. It is carried back by various routes, and by many intermediate steps, but always tends finally (except the ashes) to pass into the condition of carbonic acid, water and ammonia. These numerous routes and intermediate steps are the countless compounds that are formed in varying circumstances by the decomposing, decaying body. Wood, when decaying under various conditions resolves itself into diverse products, and so of all other organic compounds. Again, when organic matter, containing nitrogen, as blood, meat, cheese, bread, or milk, begins to putrify and perish, if it is added to a solution of sugar in water, the sugar takes on the same rotting condition, is destroyed, its elements regroup themselves into new compounds, the products of dissolution. One of these products is carbonic acid gas—a universal result of all combustion and decay—a subtle and deadly poison to all animals. Nearly one-half the sugar takes this form, and thus leaps back at one movement, to the mineral condition from which it came. The other product of this destructive change, and twin brother of carbonic acid, coming into being at the same moment and from the same source is "Alcohol." Alcohol is thus seen not to be a product of vegetable growth, its origin is not the same as the alimentary principles of food. The life creating sunbeam, "the finger of God stretched across the universe," never took atoms from the mineral world, and arranged them into alcohol. We get it only by the destruction of natural food, of wholesome aliment. It commences only when death begins. Alcohol, it is true, contains the same elements as sugar, but that does not prove that it is therefore at all similar in properties, or possesses the same relationship to the mineral system. All organized compounds consist mainly of the same three or four elements, but we do not hence conclude that they have all identical properties. The atmosphere consists of the same elements as aquafortis, but while the former is the vital sustainer of all life, the other is rank poison to it. The argument thus far against the adaptation of alcohol to the purposes of food is only presumptive. It is found in bad company, it has a suspicious origin, and if it is entitled to a place and rank among the proper aliments of man, it came not in the appointed manner, but "has climbed up some other way." We must not here prejudge the question of its adaptation to alimentary purposes. Science forbids us to reason in advance of actual observation and experiment. It may only be stated now that in chemical composition and properties, and its relation to oxygen and the combustive process, alcohol differs widely from the substance whence it was derived, and from all normal alimentary compound."

[In connection with this, we would add that carbonic acid gas is only a poison by inhaling it into the lungs. It is the gas expelled from the lungs which for the low combustion going on in our frames, requires the inhalation of oxygen. Mechanically speaking, the inhalation of carbonic acid instead of oxygen, has the same effect, as two opposing forces meeting—they destroy one another. We must guard against extreme views on this as on other scientific subjects, and Prof. Youmans exhibits the right spirit in this respect. If we proceed upon what are called by some "natural principles," no bachelor should boil his potatoes, and no good housewife bake her snow white loaf of flour bread.

Survey of California.

The government survey of California is being actively carried on after many difficulties from want of funds to meet the unavoidable expenses, the officials being divided into parties who take certain branches of the service.

The Astronomical and Magnetic party undertook the determination of the prominent headlands and harbors on the coast, and especially those where lighthouses had been ordered by Congress. In connection with this party is a topographical party for the execution of the topography of the country adjacent to the stations occupied. The plan of operations embraced the determination of the longitude and latitude of those primary stations, and the connection with them of secondary points and harbors by means of chronometers, &c. The magnetic declination and magnetic elements generally were to be determined, and whenever practicable tidal observations to be made. In pursuance of this plan, eight primary and thirteen secondary stations have been occupied, between San Diego and Admiralty Inlet, and the topography of the primary ones executed.

The Triangulation party commenced its labors in San Francisco Bay, executed that of San Diego and Monterey Bays, and the Columbia River toward Cathlamet, and upon the return of the assistant in charge to the States, the chief of the astronomical party commenced the triangulation of the Santa Barbara channel—but the badness of the rainy season rendered it impolitic to prosecute it. The number of stations occupied in the execution of the triangulation has been very great.

The Topographical parties have finished San Diego and False Bays, part of Monterey Bay, the approaches, entrance, and part of San Francisco Bay, and are still at work on it, giving shore line and points to the hydrographic party.

The Hydrographic party commenced operations by a preliminary survey of Humboldt Bay. Then followed the reconnoissance of the coast from Punta de Los Reyes to the Mexican Boundary, and in order to render this as complete as such a work can be, afterward combined with the astronomical party for the more accurate determination of the longitude and latitude of the harbors of the mainland and the Islands of the Sta. Barbara Channel. For this purpose two expeditions were made with twenty chronometers. The reconnoissance map has not yet been published, though it has been over a year at Washington, and much disappointment is expressed by those interested in our steamships and coasting trade at its non-appearance. All the harbors on the lower coast have been surveyed and sounded out and sailing directions given; most of them have been published. The next work undertaken was the reconnoissance of the Coast from Columbia River to the entrance of Admiralty Inlet, and upon its completion Shoalwater Bay and the bar and entrance of Columbia River as high as Astoria, were surveyed and sounded, and the sailing directions given. The operations of this party cannot be carried on "outside" in winter, and it is now engaged in the sounding of San Francisco Bay and keeping up tidal observations.

A colossal statue, in bronze, of the great composer, Beethoven, is making at Florence to occupy the niche in the New Music Hall, at Boston.

NEW INVENTIONS.

New Corn Planter.

Measures to secure a patent for the above have been taken by Gardner A. Bruce, of Mechanicsburg, Ill. In this machine, directly behind each furrow share is placed a hopper, and directly underneath the bottoms of the two hoppers is a "dropping slide" extending entirely across the frame, and which has a reciprocating motion given to it by a lever. In the bottom of each hopper are two holes, and each end of the dropping slide has the same, there is likewise through each side piece of the frame a vertical aperture. When the furrow has been prepared for the seed, the dropping slide is operated by a hand lever, so that one of the holes with which it is perforated coincides with another in the side frame, whilst the other hole is directly under one of the apertures in the hopper. In this position a seed drops from the slide through the frame and into the furrow, whilst, at the same time, a seed is forced from the hopper into the other hole of the slide. The certainty of this process is insured by having, in each hopper, a balance beam, to both ends of which are attached vertical rods, which alternately serve to force a seed from the hopper into the dropping slide, this plan preventing the holes from being clogged as the rods will clear them. There are two covering shares on each side of the frame, which are attached to a beam moving in sockets, and the tendency that the shares have to be thrown back is checked by fixing a slotted lever to the beam, and placing in the slot a cross-piece, whose upward motion is determined by a pin, so that the shares are regulated at will, and when necessary they can be made to clear the earth entirely.

Breech-Loading Fire-Arms.

Measures to secure a patent for an improvement in the above have been taken by A. S. Nippes of Lower Merion, Pa. The improvement consists in attaching the breech at the back of the barrel by a hinge joint, and in applying a wedge to the back of the breech in such a manner that when the wedge is brought into operation on the breech, the latter is thrown up to the back of the barrel, and forms with it a perfect joint, but when the wedge is withdrawn the barrel is allowed to fall or rather is thrown back by means of a spring, to receive the charge. The wedge is operated by a lever attached to its base by a link, and they are both secured in their position by a spring catch, which is fastened below the stock and presses firmly inside a hole or notch in the lever, so that it cannot be withdrawn without the application of considerable force. When it is desired to load the piece, the lever and wedge are drawn down, by which the breech is thrown back, and the entrance to the barrel left unobstructed, the cartridge having been inserted, the lever is operated, and in so doing throws up the breech, forcing it against a steel plate which forms part of the barrel, and renders the hinge joint perfectly tight. The vent passes through the top of the breech, where the nipple is placed, and enters through the centre.

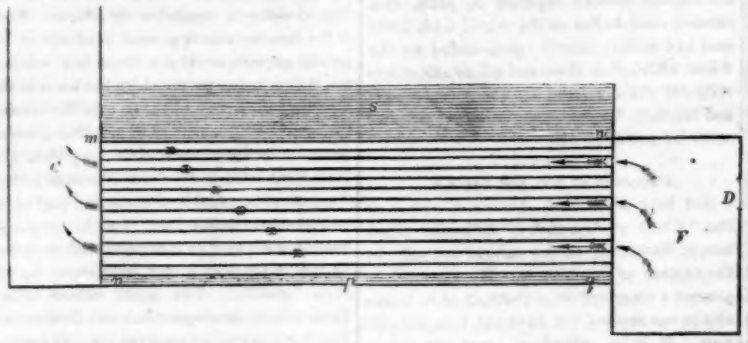
Tin Cutting Machine.

A machine of an improved character for cutting tin and sheet iron has been invented by Henry C. Hart, of New York City, who has taken measures to secure a patent. The apparatus, in its general features, resembles the cutting machine that is so universally employed by metal plate workers, but there are two improvements upon the original which require to be noticed. The bed on which the tinned or other plate is placed is hung in an adjustable lever so that its centre or pivot may be altered, and the work fashioned to a circle of any diameter. The frame which carries the shafts of the circular cutters is readily adjusted by set screws, so that the cutters can be given the proper inclination, and also be elevated or depressed as desired.

Gas Purifier.

William Wigston, of New York City, has taken measures to secure a patent for improvements in the above. The purification of the gas is effected by passing it over the surface of a liquid, and is chiefly intended to be used for the extraction of the sulphurous impurities by washing in ammoniacal liquor, either at the bottom of the dry lime purifier or in a distinct vessel; this is performed by distributing the gas, in thin streams, over the surface of the liquor, and for this purpose the inventor employs a "scrubber," which is a float of wood or of some buoyant material, to keep on the surface, of a corresponding shape with the vessel in which the purifying liquor is contained, and having an opening in the centre. On the inside it is rather concave, so as to form a cavity, and is perforated with a number of passages, by which the gas is conducted to the outside. The gas enters this cavity from an inlet pipe, and by its expansion raises the "scrubber," which is partly submerged in the liquid, so that a portion of each opening is slightly elevated above the surface, through these it escapes in a number of very thinly-spread streams over the surface of the liquor upon which it is washed or scrubbed.

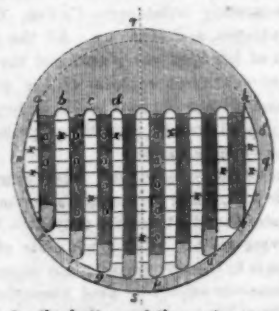
IMPROVED BOILERS AND HEATER---Fig. 1.



The annexed engravings show several improvements in Steam Boilers, and the application of the waste steam or waste hot-air of hot-air engines for additional service. The first-named improvements refer to the internal economy of the boiler, and consist in substituting for the tubular parts of boilers bent sheets of iron, which serve as partitions between the water spaces and the flues through which the hot-air, smoke, and flame pass.

Fig. 1 is a longitudinal section through the dotted line, *r s*, fig. 2, in which F is the furnace, D the door, C the chimney, S the space for the water and steam above the flue; *m n* shows the upper part of the partition plate in section—the direction of the flame and hot-air from the furnace up the chimney being denoted by the arrows. Figure 2 is a sectional view showing the disposition of the flues and water spaces. The boiler consists of a cylindrical shell, within which is another shell, forming part of a cylinder, the space between the two, *n p q*, figs. 1 and 2, being filled with water, and also strengthened with stays at *n f o' o''*, fig. 2. The inner shell at *a* and *h*, fig. 2, is secured steam tight to the plate forming the partitions, which is curved at *a e b f c g d*, fig. 2, thus alternate water spaces and narrow flues are formed. Bars of iron, *x x x*, figs. 1 and 2, are secured between the flues at short intervals apart, and run lengthwise in the boiler as shown in fig. 1; these serve two purposes, one is to strengthen the sheets of iron, which act as partitions, and the other to abstract and retain more effectually the heat that passes through the flues. The water spaces likewise below the line, *a h*, fig. 2, have narrow iron plates, *o o*, secured between the partitions, which run at right angles to the direction of the bars in the flues being vertical so as to allow the heated particles of water to ascend without obstruction. They are placed at short intervals and extend only part of the

Fig. 2.



way to the bottom of the water spaces so as to allow the water to circulate freely below them, and for this purpose they may be perforated with holes or their connection broken at different parts. The boiler, as already mentioned, consists of two distinct shells, the space between them serving as a water-jacket but if required the inner shell can be continued along the dotted line, *a h*, fig. 2, and thus form a perfect cylinder, the object of making the space between the two, and filling it with water, being only to form a kind of jacket to prevent the loss of heat.

Figure 3 is a design for another boiler of a somewhat different construction, and exhibits a novel arrangement of the water spaces and flues. Within the outer shell are placed several other circular shells, whose common centre is below that of the exterior one, the spaces for the water are marked *w*, and those for the heat *h*. Between the inner shells are placed at intervals small pieces of iron, *f f f*, which serve to support and keep them in their proper position. The communication between the water spaces is maintained by the open space, T, and a similar arrangement may be made below the centre of the boiler. With the exception of the partial breaks of the tube, T, and of the supporting pieces of iron, *f f f*, which are short, the space between the shells is open from end to end of the boiler.

Figure 3.

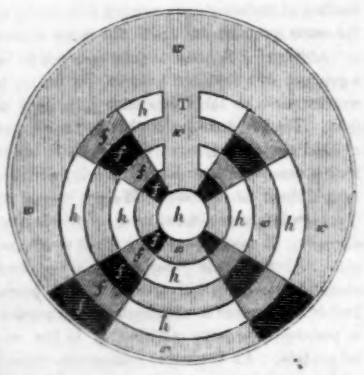


Figure 4.

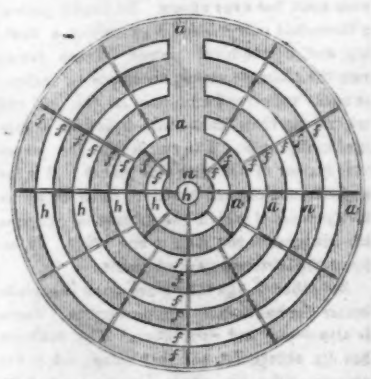


Fig. 4 is a design for a heater, intended to turn to further account the waste steam or the hot-air after being used of a hot-air engine, it consists of a number of concentric shells, *h h*, containing the steam or heated air, the alternate spaces, *a a*, between them, being filled with the air that it is required to heat. Between these shells or spaces are placed bars, *f f f*, which extend from end to end of the heater, not however in a straight line, but widening in a spiral form. By increasing the number of the bars the power to abstract and conduct the heat, is augmented, and the same object is effected by increasing the number of the shells. Further particulars respecting these inventions can be known by addressing the inventor, Wm. Henry Morrison, Indianapolis, Ind.

New Smoothing Iron.

Henry Benton, of Fairfield, Conn., has taken measures to secure a patent for the above, which he denominates a double-faced self-heated smoothing iron. It is composed of a hollow iron box of any required shape, having the top and bottom, which are made purposely heavy to retain the heat for a longer period, adjustable or rather revolving on a shaft that runs through the centre, and from which is suspended a fluid lamp, by which the smoothing iron is heated. By this method, while the smoothing iron in use is cooling, the other, which is exposed to the flame of the fluid lamp, is becoming hot, and as soon as required the position of the smoothing irons can be reversed, and thus be used alternately. The handle is of wood and supports the ends of the shaft just mentioned, which passes through the centre, the handle and smoothing iron being kept fast in their proper position by a spring catch, which is forced back by the thumb when the smoothing irons are required to be changed. The iron box is perforated to admit air to the inside, and the lamp may be made to swing loose or kept stationary by the rod which serves as a shaft.

Steam Plow and Seed Planter.

The above machine consists of a rotary plow and seed planter, invented by Theodore T. Woodruff, of Watertown, N. Y., who has taken measures to secure a patent. For this purpose several sets of plows are fixed to a shaft supported in bearings upon the same carriage with a steam engine, and as it is impelled forward, are carried round by the revolution of the shaft. The plows are firmly secured at equal distances apart to a circular disc that is fastened upon the shaft and consist of mould boards, shares, and cutters as usual, only differing from the plow that is generally constructed in their circular form.—The depth of plowing is regulated by a wheel at the end of the shaft which is driven by spur wheels and other gearing, and there is likewise a contrivance by which the plows are raised when required from the ground. The driving wheels receive their motion for the purpose of impelling the plow by means of other spur wheels, and as the driving wheels and two crank shafts of the steam engine are independent of each other, the wheels can be moved in opposite directions to turn the plow around. The seed box requires no description, as it in no manner differs from the usual construction, the seed being dropped as the plows operate, and this action is regulated by a slide which is worked by bevel wheels connected with the other gearing.

Improved Clamp.

This is likewise an invention of Henry C. Hart, of New York City, who has taken measures to secure a patent. It is intended to secure sheet metal whilst being cut into circular or other form and consists of two discs, between which is secured the sheet metal. The discs receive a rotary motion from the cutters as they act upon the material. The shaft of the upper disc has springs connected to it which are operated by an eccentric, so as to force the disc to press upon the metal and bend it firmly to the lower one, or by turning the eccentric in a contrary direction, to allow the upper disc to be raised from the work.

Improved Stuffing Box,

Measures to secure a patent for the above have been taken by R. M. Fenner, of Chittenango, N. Y. This improvement consists in the use of a metallic collar, which is inserted between the packing and the cap, so that, as the latter is screwed down, it presses upon this collar which, acting upon the upper surface of the packing causes it to spread laterally and fit steam-tight around the piston rod.

Lake Superior will soon be connected by an easy navigation with the other inland seas of that region. The contract for constructing the Sault Ste. Marie Canal has been awarded to Erastus Corning, of Albany. The work is to be completed within two years from the time of signing the contract.

Scientific American

NEW-YORK, APRIL 25, 1853.

Changes in the Value of Gold.—Wages for Labor.

From every quarter we hear of strikes among mechanics, artizans, and laborers for an increase of wages. The operatives of every trade, we believe, in the city of New York, together with waiters in hotels, coachmen, and laborers, have met in separate bodies, and have solicited an increase of wages. The movement is not confined to one city or State in our Republic, nor to our country itself. By the latest news from Europe we are informed of a like movement going on among the operative classes in Britain. There must be a cause for this general and simultaneous movement. Those who demand an advance of wages, allege that necessity compels them to ask for it. They state "that provisions and house rents have greatly advanced within the past two years, and to enable them to meet the common exigencies of life, their wages must be advanced or they will suffer." No exception can be taken to the truthfulness of these statements, but they do not give us the exact information respecting the real cause of this general movement for an increase of wages—the facts which they set forth for the necessity of an increase of wages are themselves but the effects of some cause. What is it? In our opinion it is the great increase of gold and the vast amount of it which has been added to the currency or coinage of the world within two years. There have been no general failures in the earth's fruitage for a few years past. Stones, brick, lime, and timber, for constructing houses, require no greater labor now than has heretofore been employed to shape and fit them for common use. The land still remains where it was before, and there are millions of acres yet unoccupied.—But bread, beef, houses, and lands, have increased in price, and by what cause? We believe the cause to be a depreciation of the value of gold as current coin.

The value of gold is only relative; that is, its standard must be the amount of anything else for which it can be exchanged. When it was less abundant more articles of another kind could be had in exchange for it. There was a time when our forefathers thought they were well paid when they received sixpence for a day's wages. With that amount of what we would call "small wages,' they could purchase more wheat and beef than we can do for twenty times the same amount of money. The value of gold or any current coin then, is only to be measured by the amount of the *necessaries* of life (they really bound its value) for which it can be exchanged. With every inordinate increase in the quantity of gold, or any current coin, there must of necessity be a depreciation of its value. This, as we have stated, we hold to be the cause of the recent advances in the price of provisions and rents in our cities.

We like to see every workman receive "a fair day's wages for a fair day's work." The more comfortable and respectable our people are universally, we certainly expect them to be more intelligent, happy, and moral. The wages of the operatives have in general been advanced in New York City, and we hope this will be reciprocated by those who have been directly benefitted. There is, however, a general prevailing spirit in all classes, to sell dear and buy cheap; hence it is often found that those who pay low and sell cheap are patronized by the very persons who are continually declaiming against low pay themselves. If manufacturers advance the wages of the operatives, let the operators not grudge to pay a little more per yard for the cloth which they purchase. The interests of the employer and employed are not antagonistical, they should be considered by both parties as *one*. It is, however, very difficult to raise the price of any article in general use, which has for a long time maintained a fixed price. Thus, although a newspaper proprietor advances the wages of his compositors, no increase is made in the price of his paper, because, in all likelihood it would decrease in circulation, and yet who can doubt but the said proprietor is as much affected with the high prices of which his workmen complain as they are themselves.

As the Scientific American is "the advocate of Industry," it becomes us to notice such movements among our operatives as the one we have been expatiating upon. On another page will be found some statistics of the great increase of our gold coinage—an increase so large indeed that we cannot but look upon a general increase of prices in many things as a certain consequence.

The World's Fair in London.

Our readers will find, on another page, an account of a meeting held in this city last week, by a number who were exhibitors at the World's Fair in London, in order to give public expression to their dissatisfaction respecting the manner in which the financial affairs of the American Department were managed. It appears that N. Dodge, is now an applicant for a foreign office—a Consul abroad—and the President is to be informed of his conduct at the World's Fair, in order that the applicant may not be appointed to any such office as the one he is seeking. We must say that some other period should have been chosen by complaining exhibitors for expressing their dissatisfaction, as it looks like a political personal movement,and some may say, "if Mr. Dodge had not applied for such an office no such meeting would have been called." It is right that the public should be informed respecting the manner in which our American exhibitors were treated by their own countrymen, who were appointed to watch over their interests. We do not endorse nor contradict a statement made in the Report of said meeting, because we have not received any information on the subject from those represented at the meeting. The accounts have been published in our daily papers, and if there are any statements not founded on fact, which militate against Messrs. Riddle and Dodge, they should be as publicly contradicted as they have been proclaimed. We know of no conduct so reprehensible as that of any person appointed by his government to look after the interests of his countrymen in a strange land, but who, instead of so doing, levies subsidies on them, and treats them in a heartless manner. Above all things we expect that one American shall be true to another when far from their native land.

There is only one case which we shall mention, as personally known to us, respecting the great amount which an American exhibitor had to pay at the World's Fair, to his American Commissioner. A gentleman with whom we are acquainted paid all the expenses of the articles he exhibited—having carried them to the Crystal Palace himself, and did not occupy more space than the half of a square yard, yet was charged and paid $37; his articles cost the American Commissioner no expense nor trouble whatever.

Our readers will remember that while we commended the Great Exhibition prospectively, we were cautious to advise those only who had an abundance of means to go there as exhibitors.

We believe it was Mr. Riddle who projected the New York Crystal Palace, but at present we have been informed he is in no way connected with it. We hope that the Committee appointed by the meeting referred to, will collect all the facts necessary, and publish them in a pamphlet, with vouchers for every charge made and every bill paid.

Events of the Week.

Mechanics' Society.—A letter from W. B. Robinson, of Chippewa, Canada West, informs us that a mechanics' mutual society for improvement has been formed in that place, and that at the opening of it, several articles were read with approbation from the Scientific American. The objects of the society are the cultivation of knowledge in science, practical mechanics, and chemistry. O. T. Macklin, proprietor of the foundry and machine shop in that place, has given the society the privilege of a room, and the use of such works as Tredgold on the Steam Engine, and a number of other useful works.

A rule of the society is that the members shall read an original article, and occupy no more than one hour every week, or select a good article from some mechanical work, the time of the meeting after that to be devoted to asking and answering questions, and giving opinions upon the subject.

The objects of this society are good, and we like the rules for acquiring knowledge, they are the best we could advise. We hope that perseverance will characterize the conduct of its members. We have noticed that many mechanics' societies have run well for a while until the charm of novelty was worn away; let no such conduct be exemplified by the Chippewa Mechanics' Society.

Red Cotton—Some new materials have lately been received in Manchester, England, from the south-west coast of Africa, among which is a fibrous substance sent by a missionary at Abeokuta, as a kind of *red cotton*. It came from a country further to the north, and is found in great quantities. It turns out, however, to be a species of silk, and is of a deep red color, but it has been dyed; probably it is a species of silk grass, like the kind which is so abundant in the East Indies, which is very beautiful, and will endure for a great number of years, but must not be brought in contact with steam or warm water.

Parkers' Wheel Cases.—J. Sloan, Esq., of Sloan's Mills, Ky., informs us that the air-tight cases for Parkers' wheels must not be of less area than ten times the area of the wheel issues under low falls, nor over fifteen times the area of the issues under high falls. There must at least be fifteen times the area at the discharging end of the air tight cases as the area of the issues of the wheel; the vent under the penstock must be similar. Less than this under the forebay is a serious disadvantage. This is for one wheel. For two or more wheels in one pit, the same proportions must be preserved. The inlet sluice must have the same area as the issues of the wheel. The discharge of the air-tight cases must be one inch below the surface of the tail water at the lowest stage of water when the wheel is standing.

Wrought Iron Car Wheels.—We have been informed that some of our eastern railroad companies have commenced employing wrought-iron in place of cast-iron car wheels. The problem to be solved is, whether, in the long run, the wrought or cast-iron wheels are the best; whether the wear of the one kind exceeds or not the expense of renewing the cracked and broken of the other.

Carbonic Acid Gas, its Uses.—A correspondent enquires of us, "how carbonic acid is obtained, how it is affected with heat, and whether or not carbonic acid gas engines have ever been employed." Carbonic acid gas is produced by pouring vitriol on marble dust or chalk. It is thus obtained for making *soda* water. It is also the product of the perfect combustion of pure charcoal. Its capacity for heat is the same as that of air, nearly one half less than steam. Having the same capacity for heat as air, it embraces the principle of being as great an economizer of fuel as air, and as it can be reduced to a fluid it presents mechanical advantages of a superior character. Sir Humphrey Davy threw out the idea that when carbonic acid gas was first reduced to a liquid, that its prodigious elastic force, under a low temperature eminently fitted it for moving machinery. Sir I. Brunnel took out a patent some years ago for a carbonic acid gas engine, in England, and Professor Salomon, of Cincinnati, secured a patent for an improved carbonic acid gas engine, about two years ago, in our own country. How he has succeeded we cannot tell. Carbonic acid gas can be condensed into liquid by a pressure of 40 atmospheres. This gas is so volatile that when reduced to a liquid, it exerts a pressure of 750 lbs. on the square inch at 45° Fah.—We believe that it cannot be employed so economically as steam.

American Rifles.

By the "London Mechanics' Magazine" of March 26th, we learn that a number more of trials have been made with Marston's American Rifle in London, all of which have given great satisfaction. It is about to come into extensive use in the French and British armies. The rapidity with which it can be loaded and discharged, and the self-cleaning operation of each cartridge make it the prince of fire-arms.

Silvering Glass.

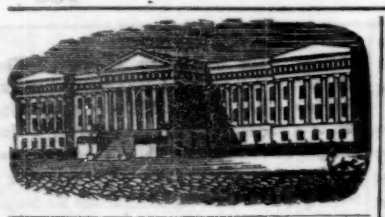
"New Way to Make Mirrors.—The 'Prattsville Advocate' states that on a recent visit to the Rev. L. L. Hill, the alleged inventor of daguerreotypes colored by the action of light, Mr. Hill showed him a new way of making mirrors. He says: 'Mr. Hill took a small glass, such as Daguerreans use for covering their pictures, and in forty seconds it was transformed into a perfect mirror—perfect in every respect. We kept an eye upon it the whole time; the process was fully explained, and the result cannot be excelled. In his mode of "silvering glass," there is not a particle of the usual amalgam of tin foil and quicksilver, but it is composed wholly of pure and unadulterated silver. The discovery was made while he was experimenting on glass, with a view of adopting it to Heliochromy, never dreaming of its beautiful application to the manufacture of mirrors. The expense of manufacturing mirrors by this new durable method, will not, we think, exceed half the cost of manufacturing the kind now used; besides, they are always perfect, and no art of man can deface them, without breaking them to pieces. We hazard nothing in predicting that it will create an entire revolution in the art of making mirrors, and that in a few years, at most, there will not be a mirror, of the kind now used, to be found in the country.—[N. Y. Tribune.

It seems to us that the Rev. L. L. Hill is exceedingly fortunate in making wonderful discoveries. Here we have recorded in the "Prattsville Advocate," that the inventor of the Hillotype has made a new discovery, nothing less than silvering glass with *pure* silver; none of your tinfoil and quicksilver, but the real Simon pure article. We do not know how it is, but the Rev. Mr. Hill is a most lucky person to make so many discoveries. It appears to us that being a person of scientific taste, he must take the Scientific American, the real *mirror* of new discoveries; the editor of the Prattsville Advocate is also familiar with our columns. We therefore recommend them to peruse page 412, Vol. 3, Scientific American, where it tells of a method for silvering glass without employing the old amalgams of tin foil or mercury, but using a solution of silver. We also recommend them to read page 45, Vol. 6, Scientific American, where it states that a process was invented by Mr. Thomson, whereby "he discarded all the old methods of using essential oils, &c., and coated all his surfaces, curved and flat, with *pure* silver." We have seen his glass in this city, and very beautiful it is.

Mr. Hill may have invented a new method of silvering glass, but he is certainly not the discoverer of making mirrors by using *pure* silver only. It would be well for his fame to publish his method, so that he might establish his claim to originality in season. He will see by what we have said, and the references we have given, that the substitution of pure silver for the old amalgam in making mirrors is anything but new. We hope the editor of the "Prattsville Journal," has not overstated the value of Mr. Hill's discovery although he is mistaken about its age, so far as the pure silver is concerned. Inventors should be posted up in the history of inventions, and they cannot be so unless they read the Scientific American. Our editorial brethren should also be more careful to remember what they read in our columns, as we often find them describing things as new inventions which we had noticed years ago.

South American Rivers.

A very slight declivity suffices to give motion to water. Three inches per mile in a smooth straight channel, gives a velocity of about three mile per hour. The river Magdalena, in South America, running for one thousand miles between the ridges of the Andes, falls only five hundred feet in all that distance. The Rio de la Plata has so gentle an ascent to the ocean, that in Paraguay, fifteen hundred miles from its mouth, large ships are seen, which have sailed against the current, all the way by the force of the wind alone. They were gradually lifted up that beautifully inclined plane higher than the loftiest of spires, by the gentle influence of the soft wind, but for the gentle descent of waters, and the power of the wind, no vessel could sail up the gigantic De La Plata.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING APRIL 12, 1853.

HARROWS—By Wm. Berlin, of Berryville, Va.: I claim constructing a double frame work of iron bars or straps of metal, and arranging and combining the two together by graduating bolts or adjustable screws and taps, by which means or contrivance, the lower frame can be elevated or depressed, and the teeth or tines, lengthened or shortened in their drag or dip.

SPRING MATTRESSES—By Edwin L. Bushnell, of Poughkeepsie, N. Y.: I claim the mode or principle of securing the springs, by attaching the free extremity of each spring, to the terminal coil of the adjacent spring, so that they mutually support each other without the use of any inflexible frame of wood or other material, at the same time that in rolling or folding up the mattress, the outside ends of the springs are exposed or open, while the inside ends contract or close, and by which means any article, so constructed, will admit of being rolled or folded upon its self or compressed, substantially as described.

SMUT MACHINES—By H. L. Fulton, of Chicago, Ill.: I am aware that a flat plate on the side of the concave has been used; this, therefore, I do not claim; but I claim the circular prismatic shaped brace and concentrator, arranged between each pair of revolving scouring plates and secured fast to the inner periphery of the case for the purpose of concentrating the grain, and throwing it upon the second scouring plate, and thereby preventing its escape, before it is effectually cleaned from the first scouring plate, directly to the discharge passage, as described.

Also, in combination with the revolving dish shaped plates, or beaters, substantially as described, the prismatic ring, for the purpose of concentrating and directing the grain from one beater to the other as described.

[See engraving page 369, Vol 7 Sci. Am.]

MATCH SPLINT MACHINES—By Reuben F. Gustine, of Chicago, Ill.:—I claim the combination of the reciprocating knife with a convex or protuberant rest, and feeding and holding mechanism, and the pressure roller, or any equivalent thereof, for the purpose described.

COIN SAFE AND DETECTOR—By J. J Hatcher, of the District of Spring Garden, Pa.: I claim a coin safe, or receptacle for coin, consisting of the arrangement of the outer case, spring, with a pad, for holding the coin up against the top of the case and slide with its projection, or their equivalents, for forcing out the coin through the slot provided for the purpose, as described.

ROSIN OIL—By S. W. Hawes, of Boston, Mass: I do not claim the form or kind of apparatus set forth, irrespective of its use or particular application; my claims being founded upon the invention or discovery, of improvements in the process of making rosin oil by means of said apparatus, or any other equivalent in principle.

Therefore I claim, first, in the process of making rosin oil, charging and discharging the still, by means substantially the same in principle or mode of operation, as those set forth, whereby I save the necessity of unluting, and prevent the incrustation of the still

Second, I claim in the process of making rosin oil the separation of the oil from the more volatile products, at different and distinct points remote from the still, instead of discharging them all together, as heretofore done, as set forth, by means of the series of recurved pipes, in combination with the series of condensers attached thereto, as set forth.

SHINGLE MACHINES—By Simon Ingersoll, of New York City: I claim the spring clipper, operated as described, in combination with the riving knife, for the purpose of insuring the complete separation of the shingle from the block, and, at the same time, throwing it on the lower bed, in position to be carried to the dressing knives, by the next advance of the driver, as set forth

HOT AIR REGISTERS—By E A. Tuttle, of Williamsburgh, N. Y.: I claim constructing the leaves, of a register or ventilator, with projections on their surfaces, to form an ornamental open or fret work, between the leaves, when they are turned with their edges uppermost or partially so, for the purpose of dispensing with the separate front or top plate of ornamental open work now employed on registers and ventilators.

SEWING MACHINES—By Wm. H Johnson, of Granville, Mass.: I claim the use of a hollow rotary clamp, as described, for holding and feeding cloth or other materials to be sewed, substantially as specified

MERCURY BATHS FOR DAGUERREOTYPING—By B. F. Upton, of Bath, Me.: I claim combining with the mercury bath and the lamp for heating it, the sliding tube and lever, or their mechanical equivalents, as described, so that by the expansion of the bath the lever may be moved so as to elevate the slide tube on the wick, and thereby decrease the flame of the lamp and the heat thereof, or caused so to act as to maintain, or nearly so, equality of evaporation, as specified.

WASHING MACHINES—By C. F. Wilgus, of West Troy, N. Y.: I claim the employment of the revolving feeding net cylinder, in combination with the two sets or circles of rollers, one set of said rollers being allowed to yield when the sack of clothes or other articles, is drawn round the net cylinder and between the said sets of rollers and made to spring back by means of the springs, which are connected to the rollers, the whole being constructed, arranged, and operated as described, and for the purpose of washing clothes and fulling and flocking cloths, as set forth.

MANUFACTURING INDIA RUBBER AND GUTTA PERCHA—By Chas. Goodyear & Robt. Haering, of New Haven, Ct. (assignors to Chas. Goodyear). Patented in England, March 4, 1851: We claim the art or method of manufacturing articles composed in part of caoutchouc, or other gums, susceptible of vulcanization, by heating or vulcanizing the same, when surrounded with and pressed upon, externally or internally by or moulded in pulverized soapstone, sand, plaster, or other similar granular, pulverized, or porous matter, or in moulds of plaster or other porous substance, as described.

SCREW BLANKS—By Cullen Whipple (assignor to the New England Screw Company), of Providence, R. I. Patented in England Nov. 30, 1852: I am aware that in machines for shaving the heads of screw blanks, the shaving cutter, whether moving on a slide or a rocker, has been moved towards and from the blank, obliquely to the axis of the blank, and therefore I do not claim, broadly, the moving of such cutter obliquely; but I claim the method of shaving the heads of screw blanks, by causing the cutter to approach the blank obliquely, and in line or nearly so, with the under side of the head, whereby the use of a rest to support the blank against the pressure of the cutter is dispensed with, as set forth.

The London Exhibition.

It appears that much discontent exists with respect to the enormous demands that are made upon the parties who sent articles, for exhibition to the World's Fair in London from this country in 1851 for the expenses incurred in forwarding them, &c. A meeting of those interested in the subject was held on the 11th instant, in this city to express their sentiments respecting the conduct of Mr. Riddle the U. S. Commissioner on that occasion.

Mr. Bell, of West Farms, said that he was an exhibitor, and instead of sending by the national vessel, sent by a private vessel. He paid all the expenses himself, and saw his goods placed in the Exhibition. He received a medal for agricultural products, which was refused to be delivered by Mr. Dodge, till £2 2s. were paid.

Mr. William Wisdom, of the firm of Wisdom, Russell & Co., of Cleveland, stated that he sent a case to his private agents, and had paid all duties, bills, &c. After the Exhibition he was told by Mr. Dodge that there was a charge for custom in and out, &c., and he experienced great difficulty in getting back his goods.

Mr. M. M. Lawrence had paid $40 before he could obtain his goods.

A. B. Allen & Co. had paid $400 on $1000 worth of goods.

Messrs. Roy & Co., of West Troy, stated that they had sent four plaid long shawls, worth in London five guineas each. They thought that they had paid all expenses, but after the exhibition Mr. Riddle advised them that he sold two of them to George Peabody for £1 2s. each: one he said, was stolen, and the other to be delivered on their order to a lady of their acquaintance, but who wrote that she was refused the shawl on presentation of said order. That a balance of £1 7 shillings was standing to the credit of the firm subject to their order.

Messrs. Mawson & Brothers had lost a fur victorine, boa, and gauntlets, &c.

It was stated that several gentlemen had to pay ten dollars to get their medals.

The Chairman stated that Mr. Riddle was notified of the meeting, and he thought he would be present.

The Secretary, Mr. Edward G. Tuckerman, presented a list in the hand writing of Mr. N. L. Dodge, of expenses actually paid on goods in London; and bills for the same expenses as demanded of the exhibitors here by Mr. Dodge, in each of which cases, over-charges to the amount of one or two dollars, had been made and generally collected (amounting in the aggregate to several thousand dollars). He further said that Mr. Dodge was an applicant for an important office where he would meet many Americans, and he pitied them if Mr. D. treated them as he did the 700 American Exhibitors in the Industrial Exhibition.

All the satisfaction, said he, that American Exhibitors could get, was that there was so much charged against their goods, and that they could pay it or let it alone.

The following preamble and resolution was offered and passed unanimously:

Whereas, There is reason to believe that wrong has been committed in the management of the affairs of the American Exhibitors at the Industrial Exhibition in London.

Resolved, That a committee be appointed to examine all vouchers for money demanded by Mr. Riddle, or Mr. N. S. Dodge, his secretary, and paid to them, and the justness of such charge, with instructions to report the same to the exhibitors.

In accordance with the above resolution, Messrs. Tuckerman, Thomas Bell, and M. M. Lawrence, were appointed said committee.

The following resolution was passed unanimously:

"Resolved, That the Secretary of this meeting be authorized to address a letter to the President of the United States, in relation to the supposed application of Nathaniel E. Dodge, of Massachusetts, for a foreign appointment. The American Exhibitors to the World's Industrial Exhibition have represented, believing that necessary proof will be furnished, that said Dodge, whilst Secretary and acting commissioner of the American Department, unworthily transacted the business for his countrymen, so far as the financial affairs were entrusted to him."

After other remarks by the gentlemen present, the meeting adjourned, subject to the call of the committee.

Colliery Explosions.

An awful catastrophe of the above-mentioned description occurred on the 23rd of last month, near Wigan, in England, by which forty or more individuals lost their lives. The spot where this dreadful accident took place is called the Arley Mine, and forms one of a cluster of eight coal pits, belonging to the Ince Hall Coal Company, extending over an area of about two miles. The explosion was fortunately confined to the Arley Mine, which is 414 yards deep, and ventilated, it is said, with every suitable regard to safety. At the time of the accident the hands employed had left off work, as it was their fortnightly pay day, and were congregated about the pit mouth waiting their turn to go up. From 140 to 150 men and boys are generally employed, and about 64 of the number had already gone up leaving a group of about 20 others at the bottom of the shaft, near the furnace by which it is ventilated, the remainder being distributed in various parts of the mine. At this time, a few minutes after 1 o'clock in the afternoon, the explosion took place, close to the furnace, and found vent up the shaft, doing considerable damage to the masonry and brick work in its progress, and shaking even the furniture of two inns that were 300 yards distant from the scene of the accident. The force of the explosion was such that a quantity of material were carried up the whole altitude of the shaft and hurled into the Leeds and Liverpool canal, which passes close to the spot. By the next morning after, the last of the living, as it was supposed, was brought out, a workman who, at the time of the explosion, was in a distant part of the workings, about three-quarters of a mile from the pit mouth, and from this lucky circumstance he escaped the more severe effects of the explosion. The accident is attributed to gross negligence on the part of the workmen, as the Company allow only Davy's Safety Lamps to be used below, and these are always kept locked. How the accident took place will probably remain unknown, but the cause of these explosions is so well understood that the reckless indifference of some of the men engaged in coal pits is almost beyond comprehension. Notwithstanding the awful warnings that are continually given, this class of men are unceasingly exposing themselves and their fellow workmen to inevitable destruction, and the colliery explosions in England are only rivalled by the steamboat explosions in the United States. When will either of these dreadful contingencies of modern civilization be one of the matters of history, which we may read as having formerly occurred, instead of having our feelings continually harrowed by accounts of such destructive calamities, that can be obviated by proper attention, and are generally attributable to neglect and mismanagement?

A Moving Bog.

A curious instance of this natural phenomenon, took place on the 3d of March, on the lands of Enagh Monmore, in the west of the County Clare. A tract of bog, about a mile in circumference, was perceived to be deeply fissured, and shortly afterwards the whole mass commenced to move in an easterly direction, and continued in motion for twenty-four hours. In that period it accomplished a movement of about 80 perches to the east of its former position, and the result has been the exposure of a quantity of bog timber, which was previously covered with peat to the depth of fifteen feet. The cause of the land slip is supposed to have been an accumulation of water in a slough which occupied the centre of the bog. It now covers a piece of ground from which the turf had been cut away.

Recent Foreign Inventions.

WOOL AND SILK FROM OLD FABRICS—L. F. Vandelin, of London, patentee. The object of this invention is to obtain wool, silk, and cotton from old fabrics, in such a condition as to admit of the same being again spun and used in the manufacture of other fabrics. This is done by passing old fabrics, while immersed in water, between a rotating cylinder, and a flat plate armed with teeth which tear the fabric to pieces and bring the fibres into a suitable state to be manufactured again into fabrics. It has hitherto been the custom to tear old fabrics to pieces for the same purpose, but only while in a dry state, it is stated that the fibres are more easily separated while in a wet state, and being constantly immersed in water, they are thoroughly cleaned at the same time.

COMPOSITION FOR STRUCTURES AS A SUBSTITUTE FOR IRON—Owen Williams of Stratford, England, patentee. This invention consists in the preparation of compositions to be used in the construction of railways, drains, sewers, cisterns, pavements, buildings, and other structures. Take 180 lbs. pitch, 4½ gallons of coal oil, 15 lbs., of brimstone, 18 lbs. of rosin, 45 lbs. of finely powdered lime, 108 lbs. of finely powdered gypsum, and 27 cubic feet of sand, or pieces of stone passed through a half inch sieve. The sulphur is first melted in a boiler with about 30 lbs. of pitch; the rosin is next introduced and the mixture caused to boil; the remainder of the pitch is then added, and the mixture boiled up, after which the lime and gypsum are gradually introduced and the mixture made to boil. The operator then puts in the sand, gravel, &c., which must be perfectly dry and previously heated, and then the coal oil is added. The whole is constantly stirred and worked together till sufficiently heated, when it is placed in moulds and pressed into shape; when cold it is ready for use. A composition for floors is made as follows; 10 lbs., of pitch, 1 quart of coal oil, 2 oz., of rosin, 5 lbs., of gypsum, 5 lbs. of lime, 4 lbs., of sulphur, one-half cubic foot of sand, one-half cubic foot of gravel about the size of peas; these ingredients are treated in the same manner as those which form the preceding mixture. A composition used for joining pieces together, or for cementing blocks in a building, is composed of 40 lbs of tar, 4 quarts of coal oil, 4 lbs. of sulphur, 2 lbs. of rosin, 6 lbs. of tallow, and 10 lbs. of lime, boiled and treated in the manner previously described.

IMPROVEMENTS IN WAX-CANDLE WICKS.—Thomas Mosdell Smith, of Hammersmith, England, patentee. This inventor states that the best material for manufacturing wicks is bleached coarse cotton yarn, slightly platted. It is found desirable to dip the wicks in a solution composed of 2 oz. of borax, 1 oz. of chlorate of potash, 1 oz. nitrate of potash, 1 oz. salammoniac, and 3 quarts of water. After the wicks are saturated in this for some time, they are dried and ready to be used for candles.

CANDLE WICKS—W. E. Cooper, of Mottram, Eng., patentee. This improvement consists in passing a portion of the strands of which the wick is intended to be composed through a solution made of bismuth and oil, or such other suitable solution as will have the effect of rendering the strand or strands so saturated more susceptible of combustion than the other remaining strands. The whole of the strands for a wick are then twisted together in the usual manner of twisting a cord. About one-third only of the strands used for a wick should be treated with the bismuth and oil. When the candle is lighted the prepared strand or strands will be presently exhausted, and so cause the wick to lean over on one side; the carbonized portion of the wick is thus given off imperceptibly, and the wick requires no snuffing.—[Condensed from Newton's London Journal, &c.

A clipper built at St. Johns, New Foundland, named the "Star of the East," was recently sold in London for $80,000. The colonial built ships seem to excel those built in England in point of speed.

TO CORRESPONDENTS.

A. A. A., of Pa.—"Humphrey's Journal," is published in this city, it is the only publication we know of devoted to Photography.

E. P. B., of Ct.—Your improvement in Paddle Wheels is not new.

T. Y. C., of N. Y.—If you consult Vol. 6 Sci. Am. on the article Precipitation of Metal, page 83, &c. it will instruct you about engravings forming matrices for electropying.

L. G., of N. Y.—We do not know the market price of manganese; it is employed but on a limited scale for the manufacture of bleaching powder, and for coloring glass.

W. F., of Mass.—Your centrifugal paddle wheel is simply a modification of a blower placed under water; it is not new, and has been employed unsuccessfully for the sume purpose before; see page 224, Vol. 5, Sci. Am.

W. J. McA., C. E., N. Y.—We are obliged to you for a copy of your report. You will perceive that we noticed it in a short article, a few weeks ago.

F. S. C., of Mass.—We have never seen a pump exactly like yours, but there is one embracing the same principle on page 271 Ewbank's Hydraulics.

J. McK., of Pa.—Your name has been entered upon our books for one year, and the back numbers sent as far as we had them.

L. W., of Vt.—A patent was granted to Francis Wolle, of Bethlehem, Pa., for a machine for making paper bags, and he is a proper person for you to address for the information you solicit of us.

F. S. C., of Boston—We cannot give you an answer with respect to the soda, but the magnesia is certainly injurious to other parts of the system, and consequently to the bones.

A. V. G., of Wis.—If the fall of the ram is 10 ft. and the height at which the water is delivered is 20 feet, the discharge will be one half.

E. H., of Mass.—There are two kinds of machines for rice hulling; the rice is pounded in one and this no doubt breaks may of the kernels.

P. H., of N. J.—Your table has been received, and your remarks are just; but we have noticed that tables are more troublesome to mechanics than simple rules, thus the diameter being 1, the circumference is to it as 3·14159, and the area is the half of the circumference multiplied by half the diameter.

——, of Pa.—It was an oversight, "billion" is a million of millions, and therefore the expression in the instance alluded to was incorrect for billion read one thousand million,—by the French calculation, the expression would have been correct, but not according to our calculation, which follows the English.

R. A. J., of Ind.—Without entering into an elaborate argument, we must inform you that your calculations are grossly erroneous; if you need any further proof on this point we refer you to articles upon this subject in Vol. 6, Sci. Am. We need not, of course, repeat those arguments when you have such excellent opportunity of examination.

A. B. of Ct.—You should always sign your name and give your address to communications addressed to editors, then they are likely to receive some ttention, otherwise they are not.

M. B., of Phila.—Speed does not mean the whole distance travelled but relative only, such as one boat faster than another; this was the reason we mentioned the miles per hour, and had you critically examined the case, you would have seen that we spoke of velocity per hour, not the final time, because it is stated that the increase of fuel was as 6 to 0·52 tons per hour, which is the fact.

L. T., of Iowa—The use of rollers for reducing friction between bearings is an old device and could not be claimed as new.

C. E., of Mass.—We are not in the habit of receiving pay for such notices, they are voluntary on our part, and we cannot depart from this, the only proper mode of conducting a journal, otherwise we are likely to deceive our readers by advocating unworthy subjects. If your alleged invention is new and useful we should not object to giving it a notice.

Money received on account of Patent Office business for the week ending Saturday, April 16:—

B. D. G., of Miss., $20; S. B. B., of N. Y., $20; E. L. B., of N. Y., $55; I. H. B., of Ct., $25; N. N. T., of N. Y., $25; J. G., of N. Y., $60; N. B., of N. Y., $236,68, G. E., of N. Y., $50; C. C., of L. I., $600, G. D., of Ohio, $35; J. G., of Pa., $55; F. O. D., of Pa., $60; J. W. H., of R. I., $25; H. B., of N. J. $27, |

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday April 16:—

S. B. B., of N. Y.; I. H. I., of Ct.; N N. T., of N. Y; D. E. McD., of N. Y.; D. A. M., of Pa.; G. B. Jr., of N. Y; H. B., of N J.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:—Of Volumes 1, 2 3 and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1?5. Of Volume 6, all; price in sheets, $2; bound, $2,?5 Of Vol. 7, all; price in sheets, $2; bound, $2,75. Of Vol. 8, all the back numbers subsequent to No. 27, but none previous.

PATENT LAWS, AND GUIDE TO INVENTORS.—We publish, and have for sale, the Patent Laws of the United States. The pamphlet contains not only the laws but all information touching the rules and regulation of the Patent Office. Price 12 1-2 cts. per copy.

A Chapter of Suggestions, &c.

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, provided they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engraving executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other Journals.

PATENT CLAIMS—Persons desiring the claims of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office—stating the name of the patentee, and enclosing one dollar as fee for copying

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

ADVERTISEMENTS.

SCIENTIFIC MUSEUM.

Moles.

At this season of the year many of our farmers and gardners are pestered with moles burrowing in their fields and gardens, and eating up young and tender roots of plants and herbs. Some directions regarding the modes of destroying these creatures, will, we believe, be very acceptable to many of our readers at this time.

The principles of mole catching are founded on the following facts:—"A mole in forming its perpendicular passages under ground, throws back the mould which it removes towards the surface, and thus forms hills.—Upon every new change of place a mole raises three, four, six or more hills according to its age, consequently all the mole-hills formed by one mole communicate by subterranean passages with one another. If a tunnel or passage recently formed by a mole is opened by an instrument, the mole will in a few minutes return to close it, in order to secure itself from danger and the external air. It constructs over the aperture an arch of loose mould, and mends the tunnels as a plumber mends a lead pipe, and should this new mole-hill be broken down, the mole will return to repair it. The male mole is stronger than the female, and raises a greater number of hills, and larger ones. Young moles form only long covered ways at the surface; when they begin to make hills they are small and arranged zig zag, without regularity. The hours of working for moles are at sun rise, about 9 A. M., at noon, at 3 P. M., and at sunset. It is at sunrise and sunset, however, when they work with the greatest vigor.

It is difficult to take moles except when they are at work, and the most favorable time for catching them is in the spring; they should be vigorously attacked at the present time, during their working hours, and sunrise is the best time. In watching for a mole, care must be exercised to make no noise by stamping or beating. Should a person be near a mole-hill when the mole stirs the mould, let him then, with his hoe, break into the passage between that and the next mole hill, and let him with a little earth close up the passage at the aperture made with his hoe; the mole will then be imprisonend between the mole-hill and the place where his passage has been broken into and stopped up. If the earth of the hill is fresh and newly raised, it may be concluded that a mole is within it, except when an aperture is left in the centre, which is an evidence that the mole has left his residence for a better. By pouring in enough of water into the tunnels between the mole hills, the animal can always be forced out. When a number of fresh mole hills are found together they should be vigorously attacked with a hoe by removing them and opening up the passages communicating among them, when the mole will be sure to be found within, but the most simple way to catch moles is to confine them between their passages as has been described. A close attention to these facts will soon enable any farmer to rid his farm of moles, especilaly if he has a terrier dog to assist him.

Devotion to Science.

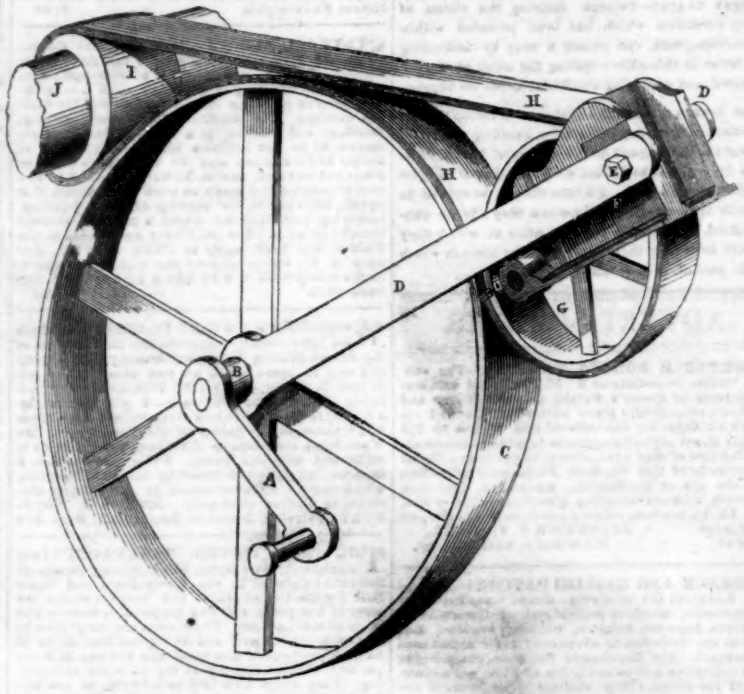
Mr. Lassell, of Liverpool, has transported his wonderful telescope (having twenty focal feet) to Malta, and under the beautiful sky of this island he has found incomparable advantages for observing his favorite planets, with whose study he has been for some years occupied, namely, Saturn, Uranus, and Neptune. Mr. Lassell has seen the first and second satellites of Saturn very distinctly. On the body of Saturn itself he has been able to observe two red-colored bands and three of a neutral or greenish blue color. He has found also the two new satellites of Uranus.

Mr. Lassell, who, from being a merchant, has become an amateur astronomer, and has himself constructed his magnificent telescope, and who has invented some absolutely perfect instruments, is himself quite astonished at what he has been able to effect at Malta, where he has made more observations in one single night, than in three months at Liverpool.

Banding Pulleys for Saws, &c.

The annexed engraving is a perspective view of an improvement in operating machinery such as circular and upright saws, pumps—in short any machine driven by belts and pulleys. The inventor is Robert W. Parker, of Roxbury, Norfolk Co., Mass., who secured a patent for the same on the 17th March, 1852. The nature of the invention consists in driving machinery, such as circular and vertical saws, blowers, rotary pumps, &c., by a peculiar arrangement of belt and pulleys, by which the main driving pulley is made to pinch the band at the points in the intermediate pulleys with any desired force. It obviates much of the friction attendant upon the ordinary modes of driving saws and other machinery.

In the figure A represents the crank to drive the power wheel, C. B is the main shaft of this wheel, and D is an arm (there is a similar one on the other side) on said shaft, extending out and supporting the frame, F, of a small pulley, G. This frame is hung by the axis, E, passing through the outer ends of two arms, D D. The pulley has its axis in the frame, F, which is allowed slightly to rise and fall to pinch the belt, H, which passes over pulley G, (and the lower part over wheel C), and around the small pulley, I, which drives shaft or spindle, J, on which may be a circular or scroll saw, or a blower or circular pump, &c.



It will be observed by this arrangement of band and pulleys, that the driving pulley is really the wheel C. The arrangement by the swinging pulley, G, pinches the belt, H, on the periphery of said wheel, C, so as to press with any degree of force against it and the pulleys, G I. By this arrangement a great velocity can be communicated to the belt by hand power. No less than 2600 revolutions have been given in one minute to a small circular saw, and one man enabled thereby to saw through a three inch plank.

This mode of banding pulleys appears to us to be a most excellent improvement, and is specially adapted to almost all portable machines, as well as those driven by steam power. It is well adapted, as we have seen for ourselves, for circular and scroll sawing, both for ripping, cross-cutting, rabbetting, &c.

The claim is as follows:—"Arranging the driving pulley (C) in reference to pulleys (G I) that the band passing over these pulleys is not only pressed with any desired force against the periphery of the driver (C), but is also pinched between C I and C G, they operating upon the band as feed pulleys, in the manner represented and described.

This method of banding may be seen applied to portable circular sawing at D. Miller's, 110 East Thirteenth street, between Third and Fourth avenues, New York City.

Shirt Collars by the Bushel.

The city of Troy has long been famous for shirt making and its shirt collars. The "Troy Whig" says:—

"There are here a large number of manufacturers, who employ from five hundred to fifteen hundred females each, on their work, besides some half dozen establishments in which the article is manufactured by machines. We know of one house in which about forty machines are used, and another where there are some thirty, and they are increased as rapidly as they can be supplied. We are told that the collars made by machine are quite as good as those made by hand. Cost by machine, per dozen, for making:—

Running	4 cents
Turning	3 "
Stitching	4 "
Banding	12 "
Thread and ironing (before stitching)	2 "
Total	25

Throwing out the cost of machines (which is about $125 each for those used here,) the expense of keeping them in order, &c., and there is an apparent difference of about 12½ cents. It is probable, however, that after making a proper allowance for this, the difference in the expense of the two systems will be slight. But a very slight saving on a dozen, where so many thousand dozens are turned off, must affect materially a year's profits. Those who manufacture machinery have an advantage, from the fact that their business may be kept principally under their own eyes. While those who continue under the old system, must send the greater proportion of their work to a distance, frequently more than fifty miles. On the other hand, those who employ hand sewers, avoid rent, fuel, &c., which have to be provided by machine workers.

Specimen from the Iron Mountain, Mo.

The "St. Louis Republic" says a curiosity will be presented at the World's Fair, in New York, that will surprise most mineralogists, and the learned and curious in these matters. It is from the pilot knob. On the summit of the Knob, which bears evidence of having been, at one time, subject to volcanic action, and where immense sheets of iron have been thrown out, of various thickness, length, and breadth—many standing in the very position and inclination that the last throe of the internal furnace poured them out—there is one of immense width, length, and breadth, but nearly of uniform thickness. A portion of this slab, several feet in length and breadth, has been detached, and will be sent to the World's Fair. It will be by far the largest sample ore of such purity, that has ever been seen by those who have not visited the Knob and Iron Mountain, and yet will be but an imperfect representation of the ores there. Some very important and extraordinary developments have been made in the face of the Shepherd Mountain. This mountain faces the Knob, separated only by a small valley. In prosecuting, a vein has been discovered, and there are doubtless hundreds of others, more extraordinary than anything yet supposed to exist in that region.

Mineral Wealth of California.

A meeting of the stockholders of some mining tracks was recently held in London, at which it was stated that coal had been discovered by some miners sent out from London. They had also found a mine of quicksilver, which the company intended to work, as it was considered more profitable than operating on gold quartz. Two large steam engines of 100 horse power each, have been sent from England, but as yet no returns have been forthcoming.

A meteor recently fell on the tower of Lincoln Cathedral, England, and set fire to one of the pinnacles during a violent snow storm. A ball of fire descended upon the centre tower of the cathedral, and burst with a loud explosion, emitting beautiful rose-colored flames and accompanied by a flash like lightning. No other signs of electricity in the air either preceded or succeeded the appearance of the meteor.

Since November 21st, 1852, there have been thirty two shocks of earthquakes within the limits of California.

LITERARY NOTICES.

BOOK OF THE WORLD, No. 8, Welk & Wieck, 195 Chestnut st., Philadelphia. This periodical publication is as interesting as ever; the current number contains a choice collection of reading matter for all. It is illustrated with the usual number of plates, and when completed, it will be a valuable work for information on natural history. In this last named department it excels in the beauty of its plates the generality of the works that are devoted to this interesting subject.

THE ANTI LANCET.—This is a new medical monthly, devoted to the chrono thermal system, and is an advocate for female medical education. It is published by G. H. Whitney, Providence, R. I. Of course it is opposed to the lancet—blood letting for disease. We hope it will not be a lancet in literature, but be temperate in language. We regret to see so many hard words used in a number of journals devoted to the medical profession: we certainly think the Allopathists are getting a tremendous scalping and lancing on every hand, and the Homeopathists, if agreed upon small doses for common patients, agree heartily in prescribing huge doses for Allopathists. Strictly speaking the Chrono-Thermal practice is Allopathy in principle.

PERFUMERY—ITS MANUFACTURE AND USE—By C. Morfitt, P. C., published by N. C. Baird. This work on Perfumery presents all the receipts and modes of making hair oils, pomatums, hair washes, face powders, cosmetics for the skin and lips, perfumes of every description, and we know not all what beside. It is an exceedingly useful book to those who manufacture perfumery on a large scale, and for those who would desire to make their own for personal use. Scented soaps, pastiles, &c., are described, and so minutely are the different processes given, that any one of ordinary understanding can repeat them. It is an excellent book, and one particularly essential, to a good family library. It is for sale by Stringer & Townsend, this city.